

Office Memorandum**SECRET**

UNITED STATES GOVERNMENT

TO : The Files

DATE: 28 February 1956

FROM :

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SUBJECT: Test of CIFAX over Microwave Link.

REF:

[redacted] Facsimile Ciphering Devices, Pages 75-78 Semi-Annual Progress Report for the Period 1 January 1955 through 30 June 1955.

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1. In accordance with paragraph 5 of the referenced report, the microwave compatibility test of the [redacted] was performed on 20 February 1956.

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2. The microwave link used was the [redacted]

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[redacted] The Signal Center [redacted] was set up as the transmitting site; and the microwave [redacted] the receiving site.

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3. The transmitting site was equipped with a Finch Intellofax Faxcard Transmitter, [redacted] and for monitoring purposes the Intellofax Faxcard Receiver. The test signal was transferred to the microwave transmitter over one pair of a 152-pair 1400-foot cable. The receiving site was equipped with the [redacted] and an Intellofax Faxcard Receiver, located adjacent to the microwave equipment.

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4. Channel 6 of the microwave system was modified so that the overall frequency response of the system, including a Gates Model SA-118 line equalizer at the receiver output, was as shown in Attachment (1). Considerable time and effort was required to eliminate a noise pulse from the microwave equipment. This pulse was approximately 1/10 volt in amplitude, 1.6 milliseconds wide, and recurred at a 15-cycle-per-second rate and made operation of the [redacted] equipment impossible.

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5. Attachment (2) is a sample of the printed copy taken during the test (subsequent to the removal of the 15 cps pulse). Note the angular presentation of the intelligence. This is caused by the Faxcard Transmitter and Receiver being out of synchronization. The inability of the synchronizing pulses to

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stabilize the Faxcard receiver was found to be solely due to the effect of a varying phase difference in the line power used at the two sites. The following is a description of the sample copy:

- a. Sample No. 1 - equipment set up as shown in Attachment (3).
- b. Sample No. 2 - the ciphered copy without deciphering.
- c. Sample No. 3 - all equipment operating except that there were no cards in the transmitter. The absence of dots in this sample indicates that no objectionable noise was generated in any part of the system.
- d. Sample No. 4 - without the [redacted] in the circuit. A comparison of Samples No. 1 and No. 4 shows a negligible amount of distortion introduced by the [redacted] equipment.

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6. It was concluded that under the conditions described herein the [redacted] equipment is compatible with the microwave type of transmission.

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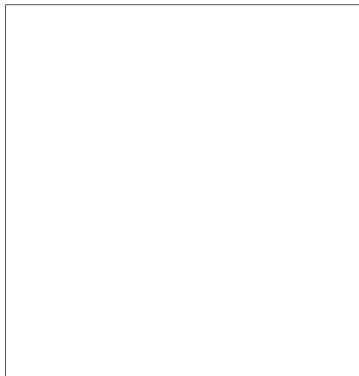
7. The test was conducted by the undersigned with the assistance of the following individuals:



NSA
NSA
OC-E/R&D
Machine Division, OCR

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Since this test was set up on a CRASH basis, the willing cooperation and support of other Divisions of the Agency is worthy of note. Those responsible were:



Cargo Branch, Transportation
Division, OL
Physical Security Division, SO
Physical Security Division, SO
Physical Security Division, SO
FBIS, [redacted]
OC-O&T/AAB
[redacted]
OC-E/PEB

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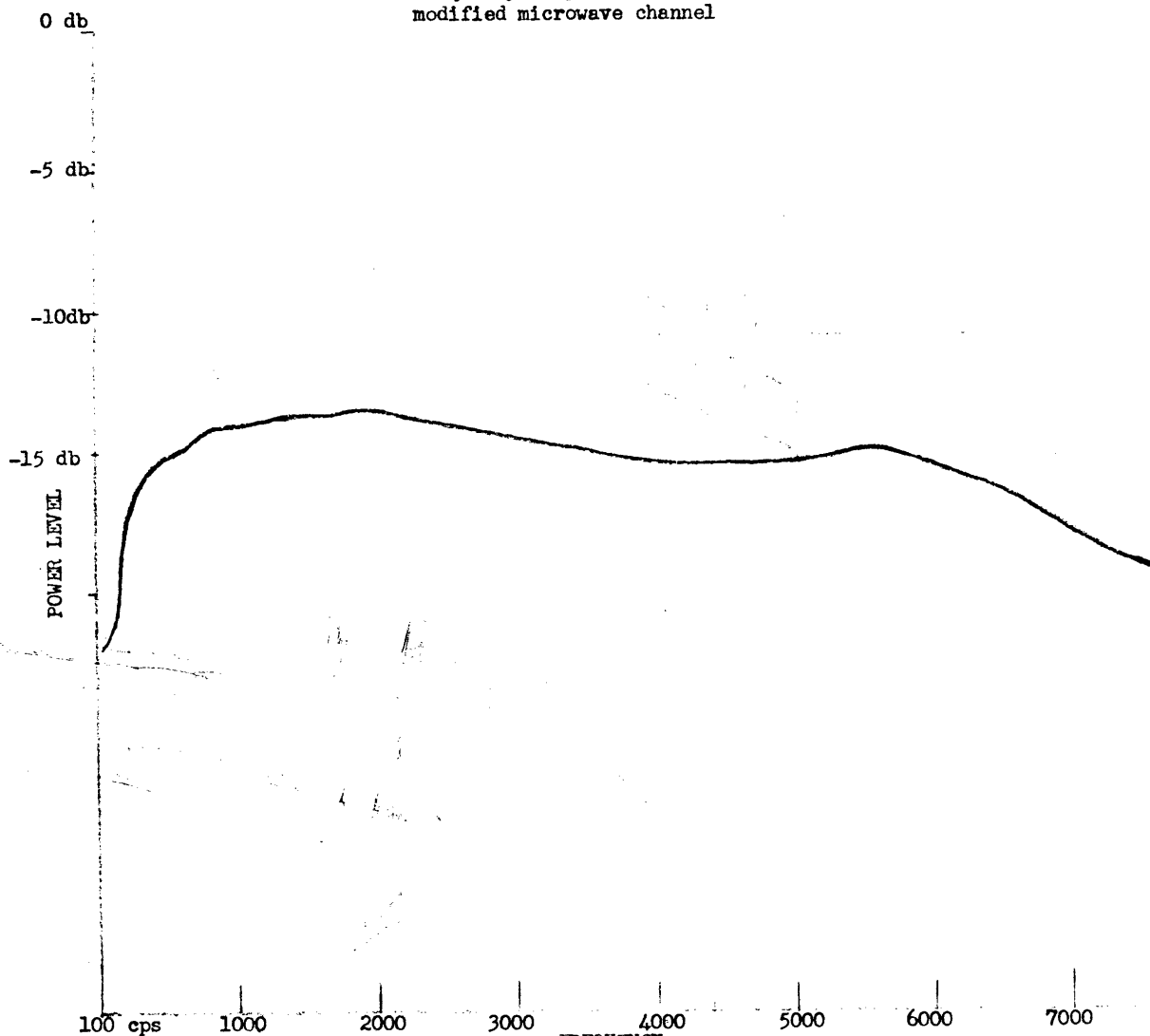
Attachments:

- (1) Frequency Response Curve of Modified Microwave Channel
- (2) Samples 1-4, as above
- (3) Test Set-up

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Compatibility Test
Frequency Response Curve of
modified microwave channel

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